REPORT

OF THE

SUPERINTENDENT OF THE YELLOWSTONE NATIONAL PARK

TO THE

SECRETARY OF THE INTERIOR

1890.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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REPORT

OF THE

SUPERINTENDENT OF THE YELLOWSTONE NATIONAL PARK.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SUPERINTENDENT
YELLOWSTONE NATIONAL PARK,
Mammoth Hot Springs, *Wyo.*, *June* 30, 1890.

SIR: I have the honor to submit the following report of my administration of affairs in the Yellowstone National Park during the fiscal year ending June 30, 1890.

I assumed charge June 1, 1889, in the midst of the travel season, and was at once so busily engaged that I did not keep any systematic record of events, and I shall be obliged to rely principally upon memory of incidents referred to.

PROTECTION OF FORESTS.

Probably the most important subject I have to report upon is the protection of the Park from forest fires. Last season was probably the most dry known in the history of Montana and Wyoming. Forest fires raged uncontrolled on every side of the Park and destroyed millions of acres of valuable timber. Commencing about the middle of July, the troops under my command were employed almost constantly and at times worked harder than I ever before saw men work, except perhaps after some disaster. Many times they were required to ride all night and fight fire all the following day.

Seventy fires are known to have occurred in the Park, all of which except three, were extinguished. One of these was between the Yellowstone and Shoshone Lakes, and before it was discovered had gained such headway that it was impossible for any force to do anything with it. It was off all routes of travel and the burnt district will seldom be seen.

The area was large and to be deplored. It was probably started by lightning as no person was believed to have been in that neighborhood; as it was not in the hunting or trapping season there were no inducements for people to penetrate that locality.

Another fire was started by some squatters just south of the Park boundary, which burned into the Park and did a great amount of damage. The other uncontrolled fire was the result of the grossest carelessness on the part of the lumbermen engaged in cutting lumber for the Lake Hotel. The fire spread from their camp fire and was three times under control and allowed to escape. It ran to the bank of the Yellowstone River and jumped it where it was 300 yards wide. This fire crossed the road between the cañon and the lake and has left a very unsightly mark.

At the time the two latter fires were burning, every available man was engaged on a fire in the Madison Cañon, doing work which approached the heroic. For three weeks officers (Capt. P. S. Bomus and Lieut. P. E. Traub) and men struggled with this fire, and in the end controlled it. If it had not been controlled it would have reached the Gibbon Cañon, and burned over one of the most beautiful drives in the Park.

An instance will illustrate the character of the work. A detachment of Troop K, First Cavalry, left this post at half past 1 o'clock one morning in August and by 6 o'clock was at a point in Gibbon Cañon 28 miles away, where it joined a detachment of Troop A, First Cavalry, which had been at work all the previous day on a fire on the top of one of the sides of the Gibbon Cañon. The climb to the work was so difficult that two men had epileptic fits from the effort. The fire was in the timber and the ground covered with fallen dry trees.

It took me just an hour to walk around it in making an examination with a view to determining whether it was possible to do anything with it. Concluding that it was worth the trial, I called up all available men—twenty-nine in number—and by night a clearing was made entirely around the fire. All combustible matter was scraped away to the earth. The fire was surrounded and controlled. There was no water on the height, and the only way to do anything was to keep the fire within bounds and let the interior burn out. High winds prevailed almost every afternoon while this fire was burning, and at times the flames would jump the cut-off and get beyond control, but as soon as the wind subsided another cut was made, and at the end of three weeks the fire was out.

If this fire had not been controlled the prevailing westerly wind would have swept it across Hayden Valley and destroyed the feed on the greatest winter range of the buffalo and elk.

Many times during the season the camps were so stripped of men that those remaining were obliged to do guard duty upon alternate days.

Up to a late date last season there was no fire equipment in the Park. The few axes and shovels supplied the troops for garrison purposes were the only tools available. Application was made for funds for the purchase of axes, shovels, and folding rubber buckets, but through some misunderstanding the authority was not promptly received, and the work was doubly hard from want of proper tools.

While at the hotel communicating with a fire party by telephone, an incident occurred which I think should be mentioned in this report. I was greatly troubled that I had not what was needed, and mentioned to a party of gentlemen that I did not know what I should do. I had exhausted all men and implements under my control and was afraid that the Park would burn in spite of every possible effort. I remarked that I had applied for rubber buckets and had failed to get them; that I supposed the Secretary had no funds, etc.; whereupon Mr. J. Lewis, of Mauch Chunk, Pa., exclaimed that "if this great United States Government or the Secretary of the Interior has not money to buy you a few rubber buckets for the protection of this wonderful and beautiful country I have." He handed me $40 from his purse. In three days I was supplied with two dozen buckets, which were of incalculable service during the remainder of the season. Would that Congress would take such an interest in the protection of the Park before it is too late.

It is proper to state here, that on the 27th of July I telegraphed to the Interior Department for permission to purchase buckets and axes for use in extinguishing fires. Prior to that time I had asked permission to expend not exceeding $50 in extending a telephone line from the hotel at Mammoth Hot Springs to my office, and in putting up signs and placards marking routes of travel and objects of interest. On the 30th of July the Department directed me to expend not exceeding $200, which was considerably more than the specific sums asked for, "for the matters referred to, towards telephone connection, signs, and placards, buckets, axes, and other incidentals necessary to the good management of the Park."

It is probably generally understood that the troops in the Park are engaged in the protection of the curiosities. They are so employed, but the amount of such work performed cuts so small a figure compared with the work on fires as not to be worth mentioning.

The work is probably not a military duty and certainly not desirable, but none other than thoroughly organized and disciplined men could be called upon to ride all night and fight fire all the next day, as has been done and done cheerfully.

Your authority for the establishment of regular camping grounds, where all camp fires can be examined as soon as abandoned, will, I think, do much to lessen the number of fires. Fires are generally traceable to camping parties. I do not charge much willful carelessness to them, but many have had no previous experience in camping, and leave their camps believing they have taken all necessary precautions. They may have left a brand, which in the morning was perfectly harmless, but in the afternoon, under the influence of high wind, becomes an incendiary of the worst character. The country has been so moist this season that I have not found it necessary to place any restrictions on camping. I shall, however, establish camps as soon as it becomes advisable.

I repeat my recommendation of last year, that there be supplied at least two tanks and the necessary number of draught animals for the transportation of water. It very often happens that fire gets into the dead roots of trees, where it can not be reached by shovels or axes. Such fires have to be watched for days or until burned out, while a few buckets of water would extinguish them at once. Special reference is of course made to fire at too great a distance from streams for the water to be carried by hand.

So much has been ably said and written upon the subject of the preservation of the Yellowstone Park that it seems hardly worth while for me to trouble you with any recital of the many reasons why Congress should deal generously with it. Language and art have so far failed to properly paint the beauty of the Grand Cañon; a single fire would seriously mar its grandeur by destroying its fringe of forest. The shores of the Yellowstone Lake have already been disfigured by fires. A single fire would entirely destroy the beauty of what bids fair to be one of the most delightful summer-hotel sites in the world.

I am so concerned for the safety of the banks of the Yellowstone Cañon that I do not permit any camping below the upper falls.

WATER STORAGE.

Visitors to the Park invariably leave it with the impression that no reasonable expense should be spared in protecting its beauties and objects of interest, but beyond all these, which can only be enjoyed by persons of means, should be considered the protection of the forest as a water-storage system. The irrigation of the arid regions of the country is attracting a great deal of attention, and vast sums will probably in the next few years be expended in some system of water storage. The time and talent of Congress is being exhausted in devising schemes for the benefit of the countries receiving their waters from this neighborhood. Yet this great natural reservoir seems to pass unnoticed. We have here about 3,400 square miles of territory, 83 per cent. of which is timbered. The altitude is great and the snow-fall enormous. The whole area is indented with natural reservoirs of from a few feet in dimension to the extent of the Yellowstone Lake. The snow in the timber clad mountains, protected as it is, melts slowly, and late in the season, after the spring rains have ceased, furnish water for irrigating purposes. The disastrous results of denuding the mountains of timber in China and other countries are too well known to require comment.

We have here the headwaters and water supply of two of the greatest mountain streams on the continent—the Yellowstone and the Snake. The freshets of the Missouri, which receives the waters of the Yellowstone, are now something terrible. The same may be said of the Snake, which has its early and later or June rise. What would be the result of only an early rise in the Snake? Simply destruction along its whole valley course. Later, when the water would be required for irrigation? Ruin to all those dependent upon a generous flow of the streams after the cessation of the spring rains. These results seem certain to follow the destruction of the forests of the Yellowstone National Park.

WILD ANIMALS.

I have every reason to believe that the protection of the wild animals in the Park has been perfect. I have no reason to believe that a single animal has been destroyed. The protection of the past few years has resulted in a great increase in all of the game animals. First in importance, on account of its almost extinction, comes the buffalo. As soon as the fires of the Park would allow me to leave the traveled routes I started out in an attempt to make something of an enumeration, but was not on their range two days before I became convinced that it was impossible. The animal, driven for safety, as he has been, to the mountain forests, seems to have entirely changed in his habits. In the summer season they are broken up into small bands and scattered over a wide area of timber-covered mountains. This I believe to be the result of the accidents of their lives. Probably when they first took to the forest they lost sight of each other, and in years adopted the habit of breaking up into families. In the winter the deep snows drive them to the open country for food. They are then found in large herds. This habit of dispersion and assembly seems to be very like the antelope.

The number of elk in the Park is something wonderful.

In the neighborhood of Soda Butte herds were seen last winter estimated at from 2,000 to 3,000. The whole open country of the Park seems stocked to its capacity for feeding. Other varieties of game animals are thought to be increasing rapidly.

As reported last year the herds of buffalo and elk do not seem to have enough calves. I am more than ever convinced that the bear and puma do a great deal of mischief and ought to be reduced in numbers. While they may be something of a curiosity to visitors to the Park, I hardly think them an agreeable surprise. Very few who come here "have lost any bear."

Visitors are sometimes a little incredulous as to the great number of large game animals in the Park and complain that they have seen nothing.

It is the habit of all animals which shed their antlers to seek the high points during the fly season, and while hundreds of elk and deer may be seen between the cañon and the lake in the first week of June, there are more at the end of the month. Very little expense would attend the inclosing of a band of elk at some point in Swan Lake Basin and of buffalo in Hayden Valley. I am sure they can be caught without any great trouble and inclosed so that all may at least see a sample.

The Park was visited last summer by Governor Francis E. Warren, of Wyoming, who manifested so lively an interest in the preservation of the game that after his departure I ventured to address him the following letter:

CAMP SHERIDAN, WYO., *November* 25, 1889.

DEAR SIR: We have, as you know, what is probably the last of the buffalo or bison left in the country. While in the Park they are comparatively safe from destruction, but, unfortunately, at certain seasons of the year they sometimes drift down into Wyoming and become a prey to the taxidermist hunter, who kills for the head.

The legislature of Montana at its last session enacted a law which will probably protect those which drift into Montana, as some occasionally do.

If you think well of it will you be good enough to ask your legislature for a similar bill? I believe the penalty should, however, be not less than $500 or six months' imprisonment, and when a fine can be collected one-half should go to the agent of the Territory or the informer.

Unless everything possible is done this last remnant of our greatest American game will certainly be obliterated.

I have addressed a letter upon this subject to the secretary of Idaho.

If both Territories will take action the Park will be as well protected by laws of the States and Territories surrounding it as by the authorities stationed within.

I am, sir, very respectfully, your obedient servant,

F. A. BOUTELLE,
Captain First Cavalry, Acting Superintendent.

Governor FRANCIS E. WARREN.

Governor Warren took prompt action on my recommendation and the legislature of Wyoming at its last session enacted a law which, if enforced, as I believe it will be, will protect all buffalo straying off the reservation in that direction.

A similar communication was addressed to the secretary of Idaho and a reply received saying that the governor would lay the matter before the legislature, but I have not learned that any action was taken.

FISH.

Reference was made in my last report to the barrenness of many streams and lakes in the Park, and the hope expressed that through Col. Marshall McDonald, United States Fish Commissioner, these streams might be stocked. I take great pleasure in reporting that that efficient officer visited the Park last season and at once decided to commence the stocking of its waters. He sent out 7,000 young trout which were planted in the west and middle forks of the Gardiner River above the falls, the Gibbon River above Virginia Cascade, and the Firehole River above Keppler's Cascade. He has now hatched and ready for shipment as soon as I telegraph him that the mountains are passable 150,000 trout and salmon for the lakes and rivers of the Park. This great work will probably be accomplished by the middle of July.

It will probably be the greatest feat in moving large bodies of young fish ever attempted and will reflect a world of credit upon Colonel Mc-

Donald, through whose efforts in another direction the price of the laborers' pound of shad has been reduced from 10 to 3 cents.

Colonel McDonald while here though not in very robust health, was not willing to take anything on faith and made the trip on horseback over a very rough mountain trail to the Shoshone and Lewis Lakes and the outlet into Snake River, making examination of all the waters he proposed to stock.

It may not appear to all that the stocking of these waters is a matter of great importance, but, being an enthusiastic angler, it appears to me very desirable that all waters of this pleasuring ground for the people should be so filled with fish that all who come may enjoy the sport. The streams are full of fish-food and there can be no reasonable doubt of the success of the enterprise. Once stocked and protected, as they can readily be, until they begin to multiply, it will be impossible, in the short season the Park is accessible, to fish them out.

THE NATIONAL ZOOLOGICAL PARK.

During my visit to Washington last winter I had many conversations with Mr. W. T. Hornaday, at that time connected with the National Zoological Park, and had agreed to send to that institution living specimens of all of our wild animals. I told Mr. Hornaday that the energies of all under my command were at the disposal of any public enterprise or institution, but that some expense would attend the capture, care, and feeding of what I should be able to send. Mr. Hornaday thought that he would be able to place a small sum at my disposal to cover the expense of traps, food, etc. I have heard nothing from Mr. Hornaday's successor and conclude that he does not think well of the idea or that it has not been mentioned to him.

RIVERS AND BRIDGES.

The work done during the past year by the Engineer Corps under the immediate direction of Lieut. W. E. Craighill, Corps of Engineers, was of a very expensive character, it being principally in Gibbon Cañon and on a grade from the old to the new site of the hotel at Grand Cañon. Both works required retaining walls and many bridges.

About 16 miles of new road were constructed.

Some very groundless complaints have been made that more new roads were not opened by Lieutenant Craighill last season with the amount of money at his disposal. I believe he is following the proper system in building roads of a lasting character as he goes and that it would be bad policy to open any roads through the timber until all roots are removed and the road made smooth and comfortable. The journey through the Park is long and at best fatiguing. A large percentage of visitors are beyond the meridian of life and unable to endure any other than good roads. The appropriation bill for the next fiscal year, as prepared, requires all work to be done by contract. I am sure the person who advocated that proviso must have done so very thoughtlessly, or have been ignorant of the situation. Of course before any work can be done by contract, surveys must be made, specifications prepared, etc. The roads in the Park are in the spring crossed by many mountain torrents and many breaks occur. Some of these are of considerable extent, others too small to be considered in contract. The crust of the roads is soft and often broken through, requiring immediate attention. Some drifts cross the roads which can only be removed by shoveling, etc.

As suggested in my telegram upon this subject, if the contract system is insisted upon, for the bulk of the work upon the roads and bridges a portion of the sum appropriated should be expended in repairs by day labor under the direction of the engineer officer in charge of the work.

About a month, with several engineers would have been necessary to make surveys and prepare contracts for repairs this spring. In the mean time the roads would have been closed, even to supplies for the hotels, and travel impossible. Visitors could not have made the tour of the Park before July 1.

The Park is a long way from the supply of labor and working material and equipment; consequently the competition on road work will be confined to a few who are now equipped. A ring will probably be formed and the work cost very much more than as now conducted.

In connection with appropriations for roads and bridges your attention is invited to the fact that preparations are being made for a great celebration in Chicago in 1893, which will probably bring to the United States more foreigners than any event in the history of the country. Liberal appropriations should be made in order that the roads through this National Park may be as nearly perfect as possible.

TRANSPORTATION.

The transportation in the Park, under the direction of Mr. George W. Wakefield, has been increased and carried nearly to perfection.

The coaches are as fine as human ingenuity can invent. In order that there may be perfect safety to passengers only perfectly gentle horses are purchased and used. They are obtained principally in Iowa, and cost about twice as much as the native horse of the country.

In the seven years Mr. Wakefield has been engaged in this business no passenger has ever received any injury.

Last year there was considerable complaint that passengers were not allowed stop-over privileges. I called Mr. Wakefield's attention to the matter and this year, besides the coaches, which make the regular trips, a daily stage leaves all the hotels for the accommodation of such as choose to stop over.

HOTELS.

I am sorry not to be able to report a better condition of affairs and progress in the matter of hotels.

The hotel at the Mammoth Hot Springs is about in character as when previous reports of superintendents were made.

The temporary shelter erected at Norris Basin after the destruction by fire of the hotel at that place in 1887 still represents a hotel with suitable first-class accommodations. Nothing has been done in the way of improvements. Not even common decencies have been provided.

Nothing has been done at either the Lower or Upper Basin hotels. At the latter point there is a very reasonable excuse for delay, as the law prohibits building upon the only suitable site in that basin. A bill now before Congress will, if it becomes a law, open this site to lease.

The two cottages at Lower Basin are very comfortable, but they will only accommodate comfortably 16 persons. When a greater number of visitors assemble at this point, all who can not be accommodated in the cottages are lodged in the old hotel, where the partitions between the sleeping apartments are so thin that any conversation in one room is distinctly heard in all others in the immediate neighborhood. As an instance of this agreeable lodging, a few nights ago, two ladies occupied one of these rooms. Two gentlemen occupied an adjoining room, and amused each other with bawdy stories until midnight. No complaint was made, and it so happened that the manager knew nothing of it until morning, or he would have ejected the loafers from the building.

The association has thrown enough money in the direction of the Grand Cañon to erect and complete a fine hotel building, but through very bad management it is still in an unfinished condition, and through bad taste will, when completed, be an unsightly affair. When a new foundation is placed under it, it will, however, be a very comfortable and commodious house.

A good hotel is in course of erection at the Yellowstone Lake.

No adequate fire-escapes have been provided at the Mammoth Hot Springs hotel and none whatever at the Cañon hotel. A fire at either of these hotels would in all probability be attended by a loss of life.

Mr. T. B. Casey, acting president of the Yellowstone Park Association, has recently visited the Park and thoroughly examined all of the hotel buildings. He spoke very freely of the bad condition of affairs and will, I think, take active measures in the direction of reform and better hotel accommodations. I have recommended to him that the association complete the hotels at the cañon and the lake, provide common decencies at Norris and the Upper Basin, which will for the present and near future be dinner stations, and bend every energy upon a good hotel at Lower Basin in the neighborhood of the Fountain Geyser. This being done tourists will have good hotel accommodations at Mammoth Hot Springs, Lower Basin, the Grand Cañon, and the Lake, and not from necessity be obliged to spend any night at either Norris or Upper Basin hotels. Visitors spend two of the four nights usually spent in the Park at Lower Basin, and are, as before explained, very uncomfortable.

Mr. Casey's visit appears to be of great importance to all interested in the management. His attention was called to all imperfections in equipment and management; also, to the necessity for increased accommodations. I am not willing to believe that the gentlemen who form the Yellowstone Park Association are or have been indifferent to the comfort of the visitors, but they have other important business and have not known the necessity for giving the hotel business personal attention. It has been delegated to managers in the park and purchasing agents in the larger cities, some of whom have been unfortunate selections.

ELEVATOR AT GRAND CAÑON.

In compliance with your instructions of September 6, 1889, in company with Mr. Arnold Hague I made an examination of the Grand Cañon with a view to reporting upon the propriety of granting Mr. D. B. May, of Billings, Mont., a lease of ground with permission to erect an elevator or incline at the lower falls for the accommodation of visitors.

At the time the examination was made it was understood that the incline should follow the first gulch south of Point Lookout. If this had been required and no building permitted at the bottom of the cañon the elevator would not have been so objectionable, but a lease has been granted permitting Mr. May to run in a direct line as near as may be and his plans indicate a straight line. The gulch has several turns, and, to run in a direct line from the top to the bottom of the cañon, it will be necessary to rear into view a very unsightly structure.

I regret that my report was not more full or that the lease was not referred to me before approval. Of course when I made my report I thought I had made a very thorough examination, but a further examination made this spring has convinced me that it was a mistake to approve of any elevator at the site mentioned, for it is impossible to put in an elevator to reach the bottom of the cañon without its coming in full sight and destroying the view from the head of the great falls. This is one of the grandest views on earth and doubly grand that the hand of man is nowhere visible.

Mr. May has had no proper examination made and was not prepared to make application for a lease at the time he received it. He was instructed that before any lease was granted he must have a careful survey made and furnish plans and drawings of everything.

I recommend that the lease be either canceled or that the incline be made to conform to the changes of direction of the gulch, and that no building of any kind be required or permitted at the bottom of the cañon.

DEPREDATIONS.

There have been no depredations upon game in the Park so far as known during the past year.

A scheme was on foot to do some work last winter at the Lake hotel site, in which all of the principal employés of the Yellowstone Park Association were implicated. Guns, traps, and poison were to have been used, but the arrangement was well known in time and their plans came to naught. The matter has been fully reported in a special letter.

During the latter part of September there occurred one of the most outrageous acts of vandalism in the history of the Park. A man by the name of Rowley, who had been employed on the lake boat, visited the Upper Geyser Basin, and leaving the hotel at the dawn of day, before any other person was awake, he broke and carried away specimens from many of the geysers. The most material damage was done to the Sponge. Two pieces, half as large as a hand, were chipped from the inside of this formation. Generations will pass in repairing the damage done by this miscreant.

This is a strong illustration of the result of there being no law in the Park. If the scoundrel had not known that there was almost immunity he would never have thought of doing this mischief. As it was, he was on his way out of the Park, and the most that could be done to him was to hasten his departure a couple of hours and deprive him of his specimens.

I sincerely hope that Congress will soon provide a civil commissioner, before whom such law-breakers may be brought and properly punished.

The boundary of the Park is still unmarked and only known by the description contained in the organic act setting it aside. This is a very embarrassing situation. Hunters are liable at any time to get inside of the line through ignorance of its location. A survey, a small cut through the timber, and the piling of a few rocks in the open country is all that is necessary and should not cost more than $10,000 or $12,000. Inclosed herewith please find a meteorological record of the station, kept by Hospital Steward Heinrick Vennemann, U. S. Army, stationed at Camp Sheridan, Wyoming.

As soon as suitable quarters are provided I shall ask General Greely, Chief Signal Officer, to order a member of the Signal Corps to duty in the Park.

Very respectfully, your obedient servant,

F. A. BOUTELLE,
Captain First Cavalry, Acting Superintendent.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

Meteorological record, Mammoth Hot Springs (Wyoming), Yellowstone National Park, from July 1, 1889, to June 30, 1890.

JULY, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	69	45	24	NW.	During night	During night	....	....	
2	67	32	35	NW.	....	....	.02	....	Rain.
3	82	34	48	S.	....	....	....	....	
4	86	45	41	SW.	....	....	....	....	
5	84	49	35	S.	....	....	....	....	
6	76	52	34	S.	....	....	....	....	
7	70	38	32	NW.	....	....	....	....	
8	65	39	26	SW.	....	....	....	....	
9	76	36	40	NW.	....	....	....	....	
10	83	45	38	S.	....	....	....	....	
11	82	45	37	W.	....	....	....	....	
12	79	43	36	NW.	....	....	....	....	
13	81	52	29	W.	5 p. m	5. 20 p. m	....	(*)	Sprinkling.
14	87	47	40	W.	....	....	....	....	
15	87	48	39	SE.	7. 40 a. m	8. 10 a. m	.01	....	Rain.
16	87	54	33	SW.	....	....	....	....	
17	84	52	32	NW.	During night 5. 40 p. m....	During night 5. 55 p. m....	.01	....	Do.
18	74	44	30	SW.	2. 25 p. m .... 5. 10 p. m	2. 45 p. m .... 6 30 p. m	.25	....	Do.
19	73	43	30	SW.	1. 10 p. m	1. 55 p. m	.19	....	Do.
20	80	42	38	S.	12. 50 p. m	1. 10 p. m	.01	....	Do.
21	73	49	24	W.	During night.	During night.	.07	....	Do.
22	76	46	30	NW.	....	....	...	....	
23	80	45	35	W.	....	....	...	...	
24	81	45	36	S.	....	....	....	....	
25	84	42	42	SE.	....	....	....	..	
26	87	44	43	W.	....	....	....	....	
27	85	50	35	SE.	....	....	....	....	
28	79	49	30	NW.	....	....	....	....	
29	81	44	37	SE.	....	....	....	....	
30	91	49	42	S.	....	....	....	....	
31	78	63	15	W.	....	....	....	....	

* Inappreciable.

Summary for the month of July.

Highest temperature, 91°, on the 30th; lowest temperature. 32°, on the 2d; mean temperature 62.55°; mean range, 34.06°; total precipitation, 0.56 inches; number of days of rain, 7.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

AUGUST, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	79	43	36	NW.	....	....	....	....	
2	79	44	35	NW.	....	....	....	....	
3	81	45	36	NW.	....	....	....	....	
4	89	46	43	W.	....	....	....	....	
5	87	48	39	SE.	....	....	....	....	
6	80	48	32	S.	....	....	....	....	
7	84	44	40	S.	....	....	....	....	
8	80	51	29	W.	....	....	....	....	
9	82	54	28	S.	....	....	....	....	
10	83	51	32	NW.	....	....	....	....	
11	87	52	35	S.	During night 4.15 p. m. .... 6.35 p. m.	During night 5.35 p. m ... 6.55 p. m....	.09	....	Thunder-storm.
12	83	44	39	NW.	....	....	....	....	
13	81	50	31	NW,	....	....	....	....	
14	87	46	41	NW.	....	....	....	....	
15	91	49	42	S.	....	....	....	....	
16	84	57	27	SE.	....	....	....	....	
17	87	53	34	S.	....	....	....	....	
18	77	56	21	S.	1.05 p. m.....	1.35 p. m.....	.01	...	Do.
19	62	41	21	SE.	6.20 a. m..... 7.55 a. m. ..	6.50 a. m.... 1.40 p. m ...	.51	....	Rain.
20	62	37	25	S.	....	....	....	....	
21	77	36	41	S.	....	....	....	....	
22	83	40	43	N.	....	....	....	....	
23	84	48	36	S.	....	....	....	....	
24	77	44	33	S.	....	....	....	....	
25	81	39	42	S.	....	....	....	....	
26	81	47	34	S.	....	....	....	....	
27	80	47	33	S.	....	....	....	....	
28	78	50	28	S.	....	....	....	....	
29	85	44	41	W.	....	....	....	....	
30	82	47	35	S.	....	....	....	....	
31	83	52	31	S.	....	....	....	....	

Summary for the month of August.

Highest temperature, 91°, on the 15th; lowest temperature, 36°, on the 21st; mean temperature, 64.01°; mean range, 34.29°; total precipitation, 0.64 inch; number of days of rain. 4.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

SEPTEMBER, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	53	33	20	N.	During night 7.55 a. m	During night 8.25 a. m	.13	(*)	Snow melted as it fell.
2	73	36	37	S.					
3	63	36	27	NW.					Heavy snow-fall on Bear Gulch Mountains, N. direction.
4	57	24	33	N.					
5	69	28	41	NW.					
6	74	42	32	NW.					
7	74	33	41	W.					
8	72	42	30	W.					
9	71	36	35	SE.					
10	62	47	15	SE.					
11	52	23	29	NW.					
12	61	27	34	NW.					
13	55	24	31	NW.					
14	52	30	22	N.					
15	64	37	27	S.					
16	63	35	28	NW.					
17	71	31	40	S.					
18	79	39	40	NW.					
19	78	42	36	NE.					
20	79	35	44	SW.					
21	69	50	19	S.	During night	During night	.01		
22	46	36	10	NW.	7.40 a. m 11.35 a. m	9.10 a. m 12.40 p. m	.35	(*)	Snow melted as it fell.
23	42	31	11	NW.	During night 8.15 a. m 2.05 p. m	During night 9.40 a. m 3.40 p. m	.05	.1	
24	42	28	14	NW.	During night 9.25 a. m	During night 12.10 p. m	.05	.1	
25	55	32	23	N.					
26	68	32	36	SE.					
27	74	36	38	S.					
28	69	37	32	S.					
29	62	42	20	S.					
30	69	51	18	S.					

* Inappreciable.

Summary for month of September.

Highest temperature, 79°, on the 19th; lowest temperature, 23°, on the 11th; mean temperature, 49.55°; mean range, 28.77°; total precipitation, .59 inch.; number of days of rain, 5; number of days of snow, 4; depth of snow-fall, 0.2 inch.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

OCTOBER, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	73	44	29	S.	....	....	....	....	
2	70	41	29	S.	....	....	....	....	
3	72	40	32	SE.	....	....	..	....	
4	78	37	41	S.	....	....	....	..	
5	79	36	43	S.	....	....	....	....	
6	78	36	42	SE.	....	....	....	....	
7	72	42	30	S.	....	....	....	....	
8	71	43	28	SE.	....	....	....	..	
9	47	38	9	E.	10.45 a. m	11.05 a. m	(*)	....	Sprinkling.
10	46	31	15	SE.	7.35 p. m	7.55 p. m	(*)	....	Do.
11	50	30	20	S.	....			....	
12	49	39	10	SE.	11.45 a. m.	1.10 p. m	.01	....	
13	57	21	36	E.	....	....	....	....	
14	55	25	30	SW.	....	....	....	....	
15	57	31	26	W.	....	....	....	..	
16	64	26	38	SE.	....	....	....	....	
17	50	31	19	SW.	....	....	...	....	
18	60	30	30	W.	6.35 p. m	During night.	.48	...	
19	49	30	19	SE.	....	....	....	....	Sprinkling at intervals during day.
20	54	32	22	SE.	....	....	...	...	
21	51	38	13	SE.	7.30 p. m	During night.	.19	....	
22	52	35	17	SW.	During night at intervals.	During night at intervals.	.32	....	
23	50	40	10	SE.	....	....	....	....	
24	49	36	13	SW.	....	....	..	....	
25	48	29	19	SE.	....	....	....	..	
26	55	33	22	S.	....	....	....	....	
27	47	26	11	SE.	....	....	....	....	
28	45	31	14	NW.	10 05 a. m.....	10.55 a. m.....	(*)	....	
29	37	18	19	SE.	During night 1.10 p. m.....	6.35 a. m.... 1.35 p. m....	.06	....	
30	36	23	13	SE.	During night 3.10 p. m....	9.55 a. m.... 4.25 p. m....	.06	.6	
31	32	26	6	N.	6.05 p. m......	7.05 a. m......	.2	3.1	

* Inappreciable.

Summary for the month of October.

Highest temperature, 79°, on the 5th; lowest temperature, 18°, on the 29th; mean temperature, 44.53°; mean range, 22.74°; total precipitation, 1.32 inches; number of days of rain, 9; number of days of snow, 2; depth of snow-fall, 3.7 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

NOVEMBER, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	38	12	26	....	....	....	....	....	
2	36	26	10	S.	10.40 a. m ... 3.35 p. m.....	1.20 p. m.... 4.40 p. m	.04	....	Snow melted as it fell.
3	29	16	13	NW.	5.55 p. m......	....	.01	.1	Do.
4	33	8	25	N.	....	During night.	.07	.7	Do.
5	42	16	26	SE.	....	....	....	....	
6	48	19	29	S.	....	....	....	....	
7	50	22	28	S.	....	....	....	....	
8	43	25	18	SE.	....	....	....	....	
9	33	21	12	SW.	....	....	....	....	
10	27	10	17	NW.	During night.	8.20 p. m......	.78	7.5	Do.
11	32	21	11	NW.	....	....	....	....	
12	26	12	14	S.	During night 1.50 p. m.....	During night 3.10 p. m....	.07	.7	Do.
13	27	9	18	SE.	....	....	....	....	
14	28	6	22	SE.	....	....	....	....	
15	39	8	31	SE.	....	....	....	....	
16	46	20	26	S.	....	....	....	....	
17	42	22	20	S.	....	....	....	....	
18	37	30	7	S.	During night 12.20 p. m.... 5.55 p. m.....	8.15 a. m.... 3.05 p. m....	.04	.4	Do.
19	39	24	15	SE.	....	During night.	....	....	
20	29	15	14	S.	12.45 p. m.....	1.20 p. m......	(*)	(*)	Do.
21	29	13	16	S.	During night 9.50 a. m.....	8.40 a. m....	.63	1.8	Do.
22	30	4	26	S.	....	During night.	.13	.5	Do.
23	33	21	12	SE.	....	....	....	....	
24	35	19	16	SE.	....	....	....	....	
25	41	19	22	SE.	....	....	....	....	
26	44	23	21	S.	....	....	....	....	
27	49	20	29	SE.	....	....	....	....	
28	35	22	13	SE.	....	....	....	....	
29	39	24	15	S.	....	....	....	....	
30	41	21	20	S.	....	....	....	....	

* Inappreciable.

Summary for the month of November.

Highest temperature, 50°, on the 8th; lowest temperature, 4°, on the 25th; mean temperature, 27.13°; mean range, 19.07°; total precipitation, 2.14 inches; number of days of rain, 0; number of days of snow, 10; depth of snow-fall, 12.3 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

DECEMBER, 1889.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	42	34	8	SE.	During day...	During day...	.04	....	Sprinkling.
2	40	33	7	S.	9 a. m.........	4 p. m	.03	.1	Snowing at night.
3	38	32	6	SE.	....	....	..	....	
4	36	28	8	SW.	....	....	....	....	
5	42	32	10	SE.	....	....	..	...	
6	39	27	12	SE.	6.45 p. m......	During night	.39	.4	Snow melted during night.
7	34	23	11	S.	....	....	....	....	
8	34	25	9	SE.	During night.	7.15 a. m	.57	6.2	
9	34	17	17	SW.	9.30 a. m......	4.20 p. m	.12	1.4	
10	29	19	10	SE.	At intervals during day.	At intervals during day.	.18	2.2	
11	39	27	12	SE.	... do	.. do	.93	4.6	Rain and snow mixed.
12	34	26	8	÷	During night	During night.	1.05	10.4	Snow melted partly during night; measured on platform.
13	37	27	10	NW.	During day...	During day...	.06	3.2	
14	38	26	12	S.	8.15 a. m...... 2 p. m	10.10 a. m .... 4.50 p. m	.06	....	Rain.
15	38	22	16	S.	During night.	9.20 a. m	.3	3.4	
16	33	11	22	S.	12.40 p. m. ...	8.10 p. m	.18	2.2	The heat of the ground, caused by the subterranean hot springs of the vicinity, melts the snow to some extent by a temperature of below freezing; consequently, the snow in the gauge becomes moist and is partly melted before measuring; hence precipitation larger than on the assumption that 10 inches of snow are equal to 1 inch of water.
17	29	11	18	S.	During night.	During night.	.04	.4	
18	26	17	9	÷	....	....	....	..	
19	25	15	10	SE.	8.20 a. m......	During night.	.75	3.2	
20	26	12	14	N.	11.10 a. m.....	4.40 p. m	.45	2.3	
21	18	7	11	SE.	8.20 a. m	6 p. m..........	.9	3.6	
22	26	14	12	S.	During night.	2.50 p. m	.7	2.8	
23	26	15	11	÷	... do	During night.	.5	4.6	
24	30	17	13	SE.	12.40 p. m. ...	... do	.75	6.2	
25	34	14	20	S.	During night.	....do	.35	3.4	
26	31	15	16	S.	At intervals ..	At intervals ..	....	(*)	
27	35	18	17	S.	....	....	....	....	
28	29	10	19	N.	8.15 a. m	11.10 a. m	....	(†)	
29	16	—5	21	SW.	....	....	....	....	
30	19	8	11	SE.	4.10 p. m	6 20 p. m	....	(*)	
31	18	9	9	SE.	2.20 p. m	3.10 p. m	...	(*)	

* Inappreciable. † Ground covered.

Summary for the month of December.

Highest temperature, 42°, on the 1st and 6th; lowest temperature, —5°, on the 29th; mean temperature, 25.17°; mean range, 12.5°; total precipitation, 8.89 inches; number of days of rain, 4; number of days of snow, 21; depth of snow-fall, 60.6 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

JANUARY, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	−5	−16	11	N.	During night				
2	−2	−18	16	N.		1.40 p. m	.2	2	
3	−13	−19	6	N.	During night	2.10 p. m	.6	6.4	
4	−11	−18	7	÷	do	4.40 p. m	.45	4.4	
5	17	−15	32	SW.					
6	13	−3	16	SE.	During night	During night	.2	2.2	
7	17	−9	26	S.					
8	26	−1	27	S.					
9	22	14	8	S.					
10	18	7	11	SW.					
11	9	−7	16	SE.	During night	During night	.5	4.7	
12	6	−9	15	SE.	do	do	.15	.9	
13	13	1	12	SW.					
14	11	−8	19	SE.					
15	14	−2	16	E.					
16	22	11	11	SW.	During night	During night	.8	3.5	
17	25	51	10	SE.	do	do	.6	2.4	
18	23	11	12	S.	do	do	.25	2.5	
19	12	−5	17	SE.					
20	16	4	12	E.					
21	18	1	17	SE.					
22	17	4	13	SE.					
23	22	11	11	S.					
24	25	21	4	S.	8.50 a. m		.7	6.8	
25	31	24	7	SE.			1.2	9.4	
26	26	18	8	E.		7.40 p. m	.75	4.5	
27	31	4	27	SE.					
28	31	25	6	SE.					
29	32	21	11	NE.					
30	35	20	15	NE.	During night	4.20 p. m	.03	2.8	
31	27	12	15	SE.					

Summary for the month of January.

Highest temperature, 35°, on the 30th; lowest temperature, 19°, on the 3d; mean temperature, 10.03° mean range, 14°; total precipitation, 6.7 inches; number of days of rain, —; number of days of snow 13; depth of snow-fall, 52.5 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

FEBRUARY, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	31	21	10	SE.	During night .	During night .	1.2	9.5	
2	38	31	7	SW.	..do .... Rain..........	...do .... Rain..........	.7 .2	— 1.5	.7 Rain since a. m.
3	40	34	6	S.	....	....	1.3	......	Rain.
4	39	30	9	NW.	7.30 a. m	6.50 p. m	.46 .55	...... 5.6	Do. Snow.
5	36	22	14	SE.	....	....	......	......	
6	37	19	18	SE.	....	....	......	......	The precipitation from 1st to 4th, inclusive, was continuous. On the 2d, in the morning, snow turned into rain; changed into snow during night. Snow turned into rain on the 3d, and rain turned into snow again 7.30 a. m. on the 4th.
7	32	23	9	SE.	....	....	......	......	
8	36	23	13	SE.	....	....	......	......	
9	35	27	8	SE.	....	....	......	......	
10	29	16	13	÷	8.10 a. m	8.30 p. m	.55	5.2	
11	29	— 3	32	SE.	....	....	......	......	
12	28	12	16	W.	....	....	......	......	
13	30	17	13	SE.	....	....	......	......	
14	23	12	11	SE.	8.20 a. m	11.10 p. m......	(*)	(*)	
15	29	18	11	S.	12.50 p. m	7.30 p. m	.25	2.5	
16	34	22	12	SE.	....	....	......	......	
17	24	17	7	SE.	....	....	......	......	
18	21	— 2	23	N.	8.20 a. m	During night .	.37	3.8	
19	22	—10	32	NE.	....	....	......	......	
20	31	— 5	36	SE.	....	....	......	......	
21	26	8	18	SE.	....	....	......	......	
22	38	10	28	SW.	....	....	......	......	
23	29	15	14	SE.	During night .	....	......	......	
24	29	—15	44	N.	....	During night .	.72	6.4	
25	—14	—26	12	N.	....	....	.35	2	
26	— 9	—30	21	SE.	....	....	......	......	
27	3	—26	29	SE.	....	....	......	......	
28	14	—11	25	S.	....	....	......	......	

* Inappreciable.

Summary for the month of February.

Highest temperature, 40°, on the 3d; lowest temperature, 30°, on the 26th; mean temperature, 17.66°; mean range, 16.44°; total precipitation, 6.65 inches; number of days of rain, 3; number of days of snow, 9; depth of snow-fall, 36.5 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

MARCH, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	21	—5	26	SW.	......	......	......	......	
2	29	12	17	SE.	......	......	......	......	
3	30	14	16	S.	......	......	......	......	
4	32	23	9	SE.	......	......	......	......	
5	45	29	16	SE.	......	......	......	......	
6	38	18	20	S.	During night	During night .	.48	3.	
7	42	15	27	SE.	7 a. m	9.40 a. m	.1	.6	
8	46	22	24	SE.	During night .	2.20	.46	2.4	
9	24	17	7	SE.	... do	......	.75	5.4	
10	Maximum thermometer broken.	8	....	SE	......	During night .	.25	1.6	
11		4		S.	11.10 a. m	11.50 a. m	(*)	(*)	
12		14	....	SW.	......	......	......	......	
13		13	..	S.	......	......	......	......	
14		20	....	S.	......	......	......	......	
15		19	..	SE.	......	......	......	......	
16		31	....	SE.	2.20 p. m	......	.4	1.2	
17		30	....	E.	......	11.10 a. m	.45	2.8	
18		33	....	SE.	8.30 a. m	7.20 p. m	.14	......	Snow melted as it fell.
19		31	...	N.	During night .	11 a. m	.02	......	Do.
20		22	....	SE.	6 p. m ...... During night . 12.35 p. m	8 p. m ...... During night . 2.20	.05 .07 .04	.3 .7	Do.
21		29	...	SE.	......	......	......	......	
22		33	...	S.	......	......	......	......	
23		26	...	SW.	Duringnight .	......	.07	.5	
24		15	...	SW.	......	During night .	.07	.6	
25		12	....	NW.	......	......	......	......	
26		31	..	NW.	During night .	During night .	.12	1.1	
27		22	....	SE.	.. do	...do	.06	.6	
28	38	24	14	S.	...do ...... 9.30 a. m	do ...... 11.20 a. m	.04 (*)	.35 (*)	
29	37	20	17	N.	1.50 p. m	......	.25	......	Do.
30	21	12	9	NW.	......	5.20 p. m	1.1	7.6	
31	28	5	23	SE.	......	......	......	......	

* Inappreciable.

Summary for the month of March.

Highest temperature, 46° on the 8th; lowest temperature, —5° on the 1st; mean temperature 24.50° (13 days); mean range, 17.31° (13 days); total precipitation, 4.92 inches; number of days of rain, 0; number of days of snow, 18; depth of snowfall, 28.75 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

APRIL, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	48	5	43	SE.					
2	59	19	40	S.					
3	52	30	22	SW.	8 p. m.				Snow melted as it fell.
4	51	31	20	NW.		During night.	.04		
5	50	33	17	NW.	11.10 a. m.		.11		
6	50	35	15	E.	12.20 p. m	During night.	.41		
7	34	28	6	NW.		7.40 p. m.	.2	1.4	
8	37	17	20	SE.					
9	47	24	23	SE.					
10	50	33	17	SE.					
11	51	30	21	NW.	1.20 p. m.	2.10 p. m.	(*)	(*)	Snow.
12	37	10	27	N.					
13	36	14	22	NW.					
14	42	13	29	NW.					
15	44	11	33	NW.					
16	50	24	26	W.					
17	56	28	28	NW.					
18	67	33	34	NW.					
19	55	35	20	N.	7.10 a. m.	7.40 a. m.	(*)	(*)	Sprinkling.
20	55	22	33	S.					
21	48	31	17	SW.	During night.	9.20 a. m.	.11	.3	Snow melted after falling.
22	57	29	28	SE.	....do				
23	34	30	4	NW.		10.10 a. m.	.52	2.2	23d, 7 a. m. The platform contained 2.2 inches of snow, while the contents of the snow gauge measured 0.52 inches. At 10 a. m there was no snow visible on the ground, temperature being 32°, while the surrounding trees carried the same quantity of snow as early in the morning.
24	46	26	20	SE.					
25	60	25	35	S.					
26	61	28	33	SE.					
27	64	33	31	SE.					
28	65	34	31	S.					
29	70	39	31	÷					
30	77	34	43	S.	3.40 p. m.	3.50 p. m.	(*)	(*)	Sprinkling.

*Inappreciable.

Summary for the month of April.

Highest temperature, 77° on the 30th; lowest temperature, 5° on the 1st; mean temperature, 38.95°; mean range, 25.60°; total precipitation, 1.39 inches; number of days of rain, 4; number of days of snow, 5; depth of snow-fall, 3.9 inches.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

MAY, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	74	32	42	NW.	....	....	....	....	
2	64	41	23	NW.	During night. 12.35 p. m. 4.20 p. m	During night. 1.10 p. m 4.40 p. m	.04 .16 .03	....	12.35 to 1.10 p. m., thunder-storm passing at a distance; temperature fell from 52° to 48° during storm; 4.20 to 4.40 p. m., thunder-storm at a distance.
3	57	38	19	NW.	During night.	During night.	.03	....	Thunder.
4	55	34	21	W.	8.50 a. m 1.55 p. m During night.	10.25 a. m 3.45 p. m During night.	.07 .05	.... (*)	Snow; melted as it fell.
5	62	35	27	SE.	During night.	During night.	.04	....	
6	72	32	40	W.	....	....	....	...	
7	77	36	41	SW.	....	....	....	....	
8	66	41	25	NW.	9.50 a. m At intervals.	3.40 p. m At intervals.	.05	....	
9	53	40	13	NW.	10.20 a. m 2.10 p. m At intervals.	11.40 a. m 5 p. m At intervals.	.14 .16	....	
10	60	35	25	NW.	During night.	During night	.35 .12	....	
11	47	32	15	N.	1 p. m	12.20 p. m 8.50 p. m	.44	2.1	11th, 5 p. m., rain turned into hail; 5.35 p. m., hail turned into snow; snow measured at 7 a.m. (12th); had partly melted during night; lowest temperature, 26°; total precipitation, .44; melted snow in gauge; depth of snow on platform, 2.1 inches.
12	45	26	19	SW.	Intervals of short duration.	Intervals of short duration.	.02	(*)	Snow; melted as it fell.
13	62	32	30	SW.	....	....	....	...	
14	58	34	24	NW.	12.15 p. m	5.20 p. m	.02	....	Sprinkling.
15	57	30	27	W.	During night.	During night.	.01	....	
16	65	37	28	W.	4.50 p. m	5.30 p. m	.01	....	Thunder-storm passed at a distance.
17	63	43	20	NW.	....	....	....	....	
18	63	36	27	NW.	....	....	....	....	
19	69	34	35	SE.	....	....	....	....	
20	64	36	28	SE.	....	....	....	....	
21	58	35	23	SW.	1.30 p. m 3.20 p. m	3.20 p. m 3.35 p. m	.11	(*)	1.30 to 3.20 p. m., rain; 3.20 to 3.35 p. m., snow; melted as it fell.
22	68	30	38	SE.	....	....	....	....	
23	66	43	23	S.	....	....	....	....	
24	70	40	30	SW.	....	....	....	....	
25	72	48	24	SE.	....	....	....	....	
26	74	34	40	S.	....	....	....	....	
27	71	46	25	W.	11.30 a. m	11.45 a. m	....	(*)	
28	64	29	35	NW.	....	....	....	....	
29	59	26	33	SE.	....	....	....	....	
30	61	30	31	E.	During night.	During night.	.12	....	
31	72	40	32	S.	During day at intervals.	During day at intervals.	.03	....	

* Inappreciable.

Summary for the month of May.

Highest temperature, 77°, on the 7th; lowest temperature, 26°, on the 12th; mean temperature, 49.59°; mean range, 27.84°; total precipitation, 2 inches; number of days of rain, 16; depth of snow-fall, 2.1 inches; number of days of snow, 4.

Meteorological record, Mammoth Hot Springs, Wyo.—Continued.

JUNE, 1890.

Date.	Self-registering thermometer.			General direction of the wind.	Precipitation.				Remarks.
	Maximum.	Minimum.	Range.		Began.	Ended.	Quantity.	Depth of snow-fall.	
	°	°	°						
1	70	37	33	S. E					
2	68	38	30	S. W	During night	During night	.30		Rain and snow mixed.
3	54	32	22	N. W	6 a. m. During night	6 p. m. During night	.16 .10		Melted snow in gauge.
4	49	31	18	S. E					
5	57	30	27	W					
6	69	30	39	S					
7	75	39	36	S					
8	80	43	37	S. E					
9	82	45	37	S. W	7 p. m.	8.30 p. m.	.20		Thunder-storm from 7 to 8.30 p. m.
10	78	43	35	S. E					
11	79	41	38	S. E					
12	73	39	34	N. W					
13	58	31	27	N. W					Sidewalks are covered with frost.
14	62	29	33	S. W					Sidewalks and fences are covered with frost.
15	59	37	22	S. E	During night 4.50 p. m.	During night 6 p. m.	.10 .04		Sun-shower; rainbow observed in southeasterly direction.
16	66	34	32	S					
17	71	41	30	S. E					
18	73	45	28	S					
19	72	44	28	W	At short intervals.	At short intervals.	.04		Sprinkling.
20	68	42	26	S					
21	63	41	22	S. E					
22	71	40	31	E					
23	73	41	32	S. E					
24	80	39	41	E					
25	78	47	31	S					
26	70	44	26	S. E					
27	65	40	25	S. E					
28	69	41	28	S. E					
29	80	42	38	S					
30	87	43	44	S. E					

Summary for the month of June.

Highest temperature, 87°, on the 30th; lowest temperature, 29°, on the 14th; mean temperature 57.97°; mean range, 31°; total precipitation, 0.64 inches; number of days of rain, 4; number of days of snow, 2; depth of snow-fall, 0.26 inches of melted snow.